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Cylindrical GEM Inner Tracker for the BESIII experiment

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A ten years extension of the data taking of the BESIII esperiment, recently approved, motivated an upgrade program both for the leptonic collider BEPCII (Beijing Electron Positron Collider II), that host the experiment, and for some of the subdetectors, that compose the spectrometer.
This presentation will focus on the upgrade foreseen for the inner tracker. The present multilayer drift chamber is suffering of ageing and the standing proposal is to replace it with a detector based on Cylindrical GEM (Gas Electron Multiplier) technology. This Inner Tracker is composed of three layers of cylindrical triple-GEMs. The CGEM-IT will not only restore the design efficiency, but also improve the secondary vertex reconstruction and the radiation tolerance. The custom developed mechanic and electronic design will guarantee excellent performance in the wide range of incident angles in a 1 Tesla magnetic field.
The front-end electronics is composed by 64 channels ASIC featuring a fully digital output that allow to be operated in trigger-less mode and can provide analog charge and time measurements. All these components, together with optimized gas mixture, gain value settings and reconstruction algorithms, will allow to reach a position resolution to the level of ~130 μm in the transverse plane and better than 350 μm along the beam direction. In this presentation, the general status of the project will be presented, with a particular focus on the recent preliminary results from the cosmic data taking and the future plans.

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